

CLAIMS

- 1 1. A system for reducing artifacts caused by illuminant flicker, said system
2 comprising:
3 an image sensor comprising an array of pixel circuits arranged in rows, a first
4 of the pixel circuits being located in a first of the rows, a second of the pixel circuits
5 being located in a second of the rows, the first of the pixel circuits being operable to
6 acquire first information corresponding to the scene at a first time, the second of the
7 pixel circuits being operable to acquire second information corresponding to the scene
8 at a second time subsequent to the first time and to acquire third information
9 corresponding to the scene at a third time subsequent to the second time, the first of
10 the pixel circuits being further operable to acquire fourth information corresponding to
11 the scene at a fourth time subsequent to the third time;
12 the image sensor being operable to combine the first information and the
13 fourth information to provide a first output signal corresponding to the first of the
14 pixel circuits, and to combine the second information and the third information to
15 provide a second output signal corresponding to the second of the pixel circuits.
- 1 2. The system of claim 1, wherein the first of the rows of pixel circuits is located
2 adjacent to the second of the rows of pixel circuits

1 3. The system of claim 1 further comprising:
 2 a controller operable to provide an input signal to the image sensor to set
 3 timing of a reset and read operations of the rows of pixel circuits; and
 4 flicker detector operable to provide the controller with a signal corresponding
 5 to a detected amount of flicker artifact acquired by the array.

1 4. A system for reducing artifacts caused by illuminant flicker, said system
 2 comprising:
 3 an array of pixel circuits operable in a bi-directional mode during which the
 4 array acquires first information corresponding to a scene in forward row-sequential
 5 order of the pixel circuits and then acquires second information corresponding to the
 6 scene in reverse row-sequential order of the pixel circuits; and
 7 an image processor operable to receive the first information and the second
 8 information and to combine the first information and the second information to
 9 provide an output signal corresponding to the scene.

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 1 5. The system of claim 4, wherein at least one of the pixel circuits comprises a
 2 complimentary metal oxide semiconductor (CMOS) pixel circuit.

1 6. The system of claim 5, wherein the at least one of the pixel circuits comprises
 2 a 3T pixel circuit.

1 7. The system of claim 4, wherein the array of pixel circuits has a detection cycle
2 having a duration corresponding to a duration of the flicker cycle of the illuminant.

1 8. The system of claim 7, wherein the detection cycle is temporally aligned with
2 the flicker cycle of the illuminant.

1 9. The system of claim 4, wherein the array of pixel circuits is further operable in
2 a uni-directional mode during which the array acquires information corresponding to
3 the scene only in the forward row-sequential order of the pixel circuits.

1 10. The system of claim 9, further comprising:
2 a controller operable to provide an input signal to the array of pixel circuits,
3 the input signal selectively causing the array to operate in either the bi-directional
4 mode or the uni-directional mode.

1 11. The system of claim 9, further comprising:
2 means for selectively causing the array to operate in either the bi-directional
3 mode or the uni-directional mode.

1 12. The system of claim 10, further comprising:
2 a flicker detector communicating with the controller and operable to provide
3 the controller with a signal corresponding to a detected amount of flicker artifact
4 acquired by the array.

1 13. A method for reducing artifacts caused by illuminant flicker, said method
2 comprising:
3 providing pixel circuits; and
4 operating the pixel circuits in a bi-directional mode during which first
5 information corresponding to a scene is acquired in forward row-sequential order of
6 the pixel circuits and then second information corresponding to the scene is acquired
7 in reverse row-sequential order of the pixel circuits.

1 14. The method of claim 13, further comprising:
2 combining the first information and the second information to form frames of
3 image information corresponding to the pixel circuits.

1 15. The method of claim 13, wherein a duration of a detection cycle of the pixel
2 circuits corresponds to acquisition of the first information and acquisition of the
3 second information; and
4 further comprising:
5 aligning the detection cycle with the flicker cycle of the illuminant.

1 16. The method of claim 15, further comprising:
2 providing an illuminant exhibiting an illuminant waveform; and
3 wherein, in aligning the detection cycle, a first time period during which the
4 first information is acquired corresponds to a first portion of the illuminant waveform,
5 and a second time period during which the second information is acquired
6 corresponds to a second portion of the illuminant waveform, demarcation of the first
7 portion and the second portion of the illuminant waveform occurring at a location of
8 symmetry of the illuminant waveform about an arbitrary illumination level.

1 17. The method of claim 16, further comprising:
2 detecting flicker artifact in the information acquired; and
3 adjusting the duration of the detection cycle of the pixel circuits to reduce the
4 flicker artifact in subsequently acquired information.

1 18. The method of claim 16, further comprising:
1 selectively operating the pixel in either the bi-directional mode or a uni-
2 directional mode, during which information corresponding to the scene is only
3 acquired in the forward row-sequential order of the pixel circuits.